

Cable Attenuation:

	S_{21} cal
12.5 GHz	4.4 dB
8.75 GHz	3.4 dB
5.346 GHz	2.72 dB

Isolator #1 (ISO 1)

	S_{12}
5.346 GHz	-18.5 dB
6.66 GHz	-29.07 dB
8.01 GHz	-28.2 dB
8.63 GHz	-17.4 dB
8.90 GHz	-10 dB
9.60 GHz	-9.62 dB
10.0 GHz	-7.9 dB
11.56 GHz	-2.67 dB
12.22 GHz	-21.93 dB
12.67 GHz	-7.2 dB

Isolator #2 (ISO 2)

	S_{12}
5.346 GHz	-10.4 dB
5.96 GHz	-13.63 dB
7.01 GHz	-20.2 dB
8.26 GHz	41.5 dB
8.73 GHz	44.0 dB
10.36 GHz	-21.82 dB
11.45 GHz	-40.1 dB
11.91 GHz	-22.84 dB
12.67 GHz	-15.02 dB

Mixer #1 (MxR1)

-35 dB ~~loss~~ loss

$$f_{LO} = 10 \text{ GHz}, +15 \text{ dBm}$$

$$f_{RF} = 10.156 \text{ GHz}, 0 \text{ dBm}$$

Mixer #2 (MxR2)

-6 dB loss

$$f_{LO} = 10 \text{ GHz}, +10 \text{ dBm}$$

$$f_{RF} = 10.156 \text{ GHz}, 0 \text{ dBm}$$

Mixer #3 (MxR3)

-10 dB loss

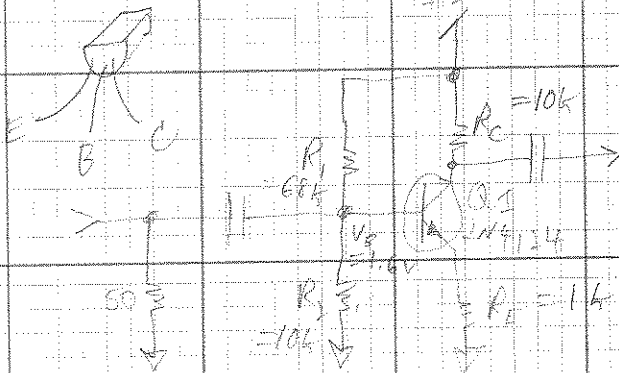
$$f_{LO} = 10 \text{ GHz}, +10 \text{ dBm}$$

$$f_{RF} = 10.156 \text{ GHz}, 0 \text{ dBm}$$

Note: RF and LO ports are
reversible, could be a
single balanced mixer

Amplifier 1 (LNA 1)

	<u>S₂₁</u>	<u>I_{P1}</u>	
5.31 GHz	+17.5 dB +17.4 dB +17.4 dB +12.75 dB	+18 dB _m	
6.196 GHz	+23 dB	+23 dB_m	+19.5 dB _m
6.52 GHz	+29 dB +27.3 dB	+23.7 dB_m	+20.5 dB _m
9.50 GHz	+23 dB	+24.3 dB_m	+21.5 dB _m
10.12 GHz	+20 dB	+23.0 dB_m	+21.3 dB _m
10.42 GHz	+17 dB	+22.0 dB_m	+19.5 dB _m
10.65 GHz	+14 dB	+21.0 dB_m	18 dB _m
10.79 GHz	+11 dB	+17 dB _m	
11.22 GHz	+8 dB	+15 dB _m	
11.29 GHz	+6 dB +6 dB	+14 dB _m	



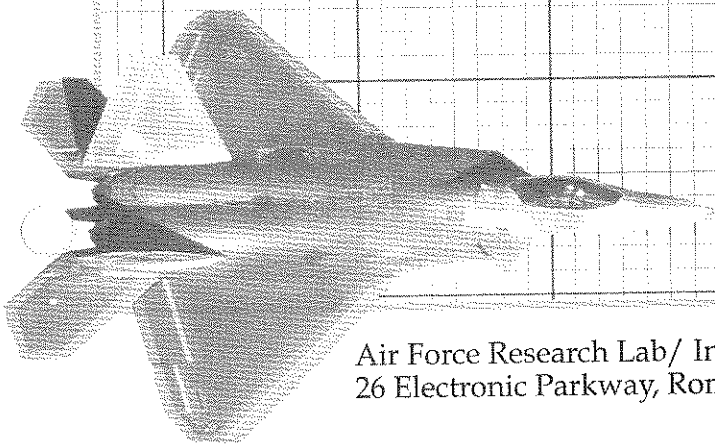
$$h_{FE} (\beta) = 120$$

$$I_C = I_{E1} = \frac{(V_B - 0.6)}{R_E} = \frac{(V_B - 0.6)}{1k} \Rightarrow V_B = 1.6V$$

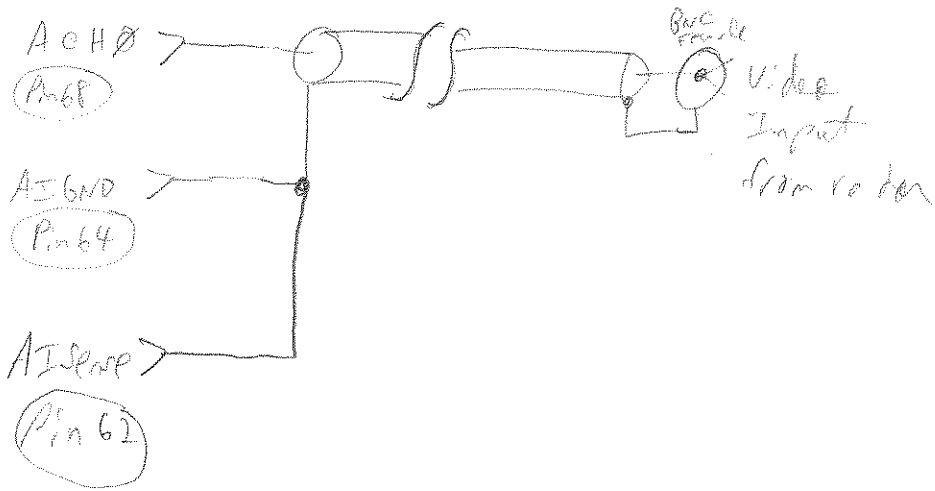
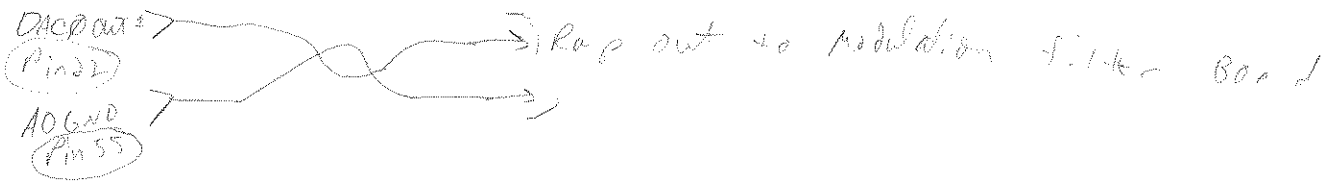
$$\frac{1}{15} (R_1 || R_2) \ll h_{FE} R_E = 120(1k) = 120k\Omega$$

$$\Rightarrow (R_1 || R_2) = 12k$$

$$1.6 = 12 \left(\frac{R_2}{R_1 + R_2} \right) \Rightarrow \frac{R_2}{R_1 + R_2} = \frac{1.6}{12} = 0.133$$



Misc I/O Connections Wiring



$$1.52 - .14 = 1.380$$

Rear Panel Connections

X/Y Motor Connector:

	Pin	Job	Motor Wire Color
X axis	A	A _x	Red
	B	B _x	Grn
	C	C _x	Yel
	D	D _x	Blu
	E	+5	wht
	F	+5	Blk
Y axis	G	A _y	
	H	B _y	
	I	C _y	
	J	D _y	
	K	+5	
	L	+5	
	M	NC	
	N	NC	

Main Power Connector:

Pin	Job	color on Power cable
A	?	
B	+12	Red
C	?	
D	?	
E	-12	Blk
F	+15	wht
G	GND	Grn

Motor Connector:

Pin	Mot. wire	Pin on Mot. C-Block	Job	Pin on DB9 Male	Misc. ^{Extra} Wires
A	Red	A	} Hot Phase AB		Blue
B	Grn	B			
C	Yel	C	} Hot Phase CD		
D	Blu	D			
E					
F					
G					
H					
I					
J			GND	Pin 5	all wires Shield
K			RxD	Pin 2	Blk
L			TxD	Pin 3	wht
M			NC		
N			NC		

RMV Motor Controller Connections

+B } +
GND } 12VDC
 -

M GND	A	B	C	D	+VM
↓	GRN	Red	Blu	Yel	+28VDC

JANUARY 2006

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



North American Color, Inc.

a full service graphic arts company

FEBRUARY 2006

S	M	T	W	T	F	S
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

ieit 2006

May 7-10, 2006
Michigan State University
East Lansing, Michigan, USA

H. Mousavinezhad
General Chair
S. Udpa, L. Udpa
Conference Co-Chairs



MARCH 2006

S	M	T	W	T	F	S
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

APRIL 2006

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23	24	25	26	27	28	29
30						

MAY 2006

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28	29	30	31			

JUNE 2006

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25	26	27	28	29	30	

JULY 2006

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30	31					

AUGUST 2006

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27	28	29	30	31		

SEPTEMBER 2006

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OCTOBER 2006

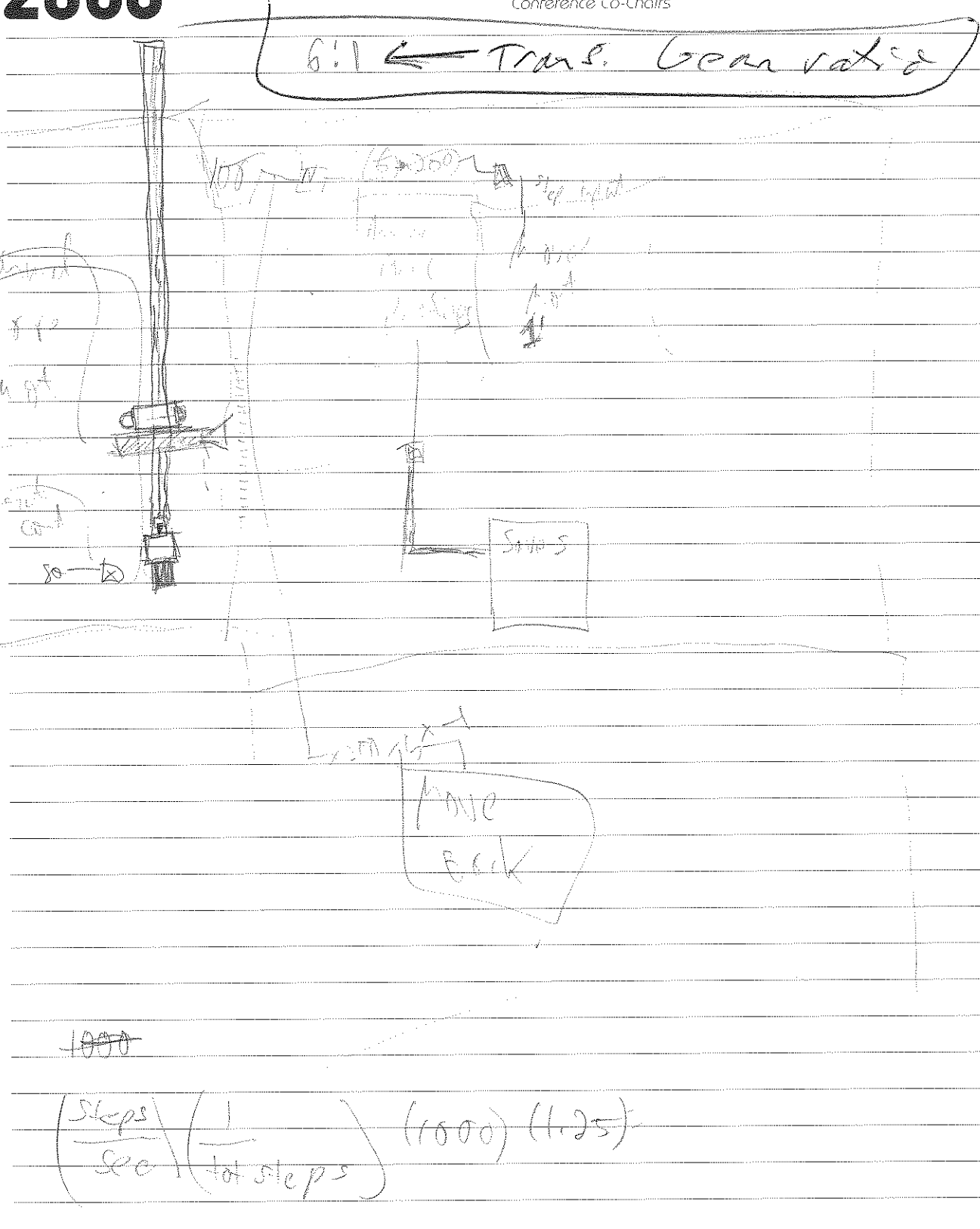
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29	30	31				

NOVEMBER 2006

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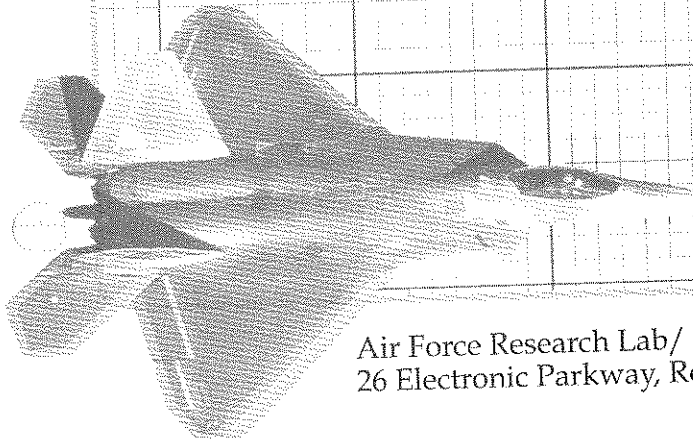
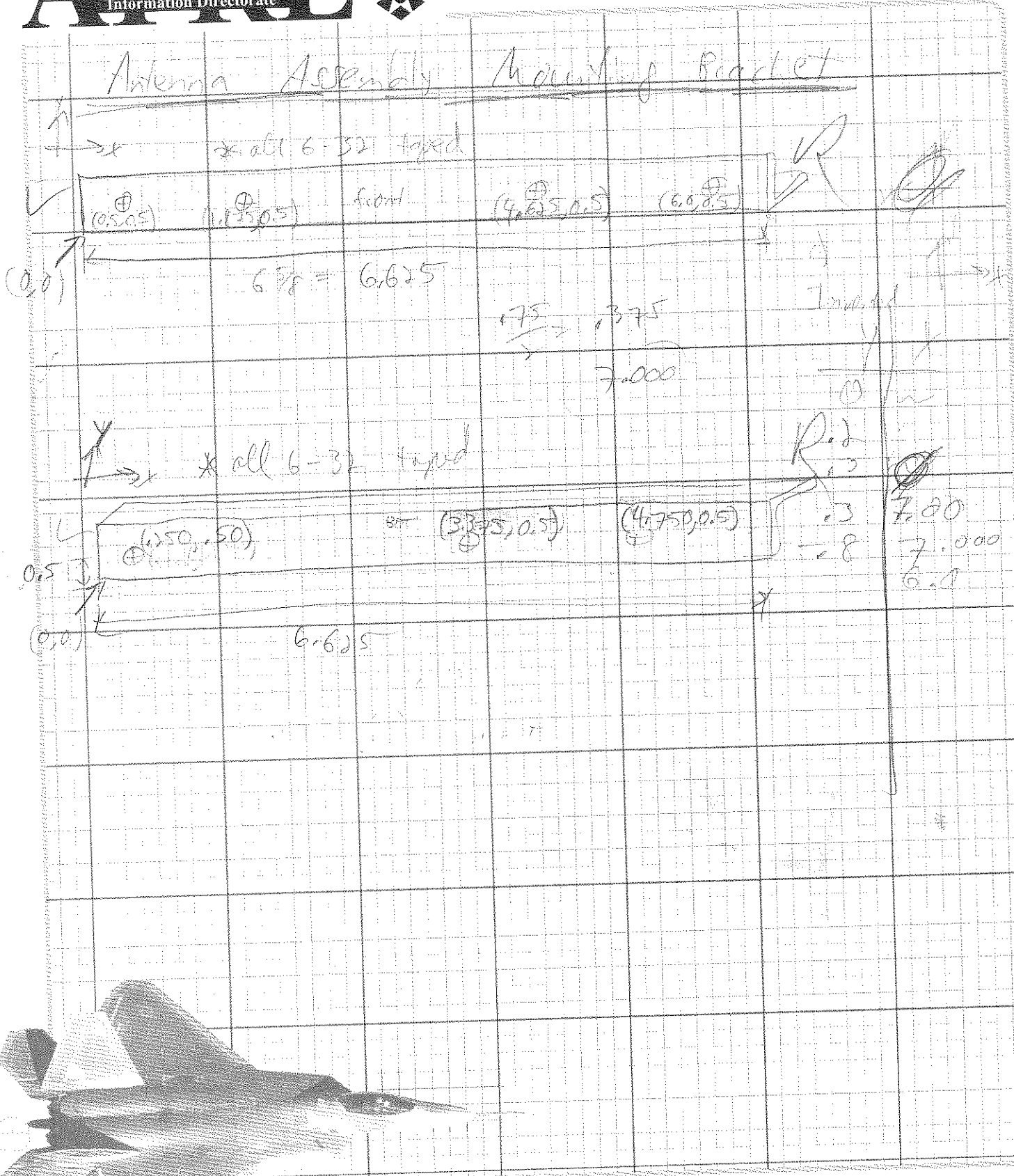
DECEMBER 2006

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24	25	26	27	28	29	30
31						



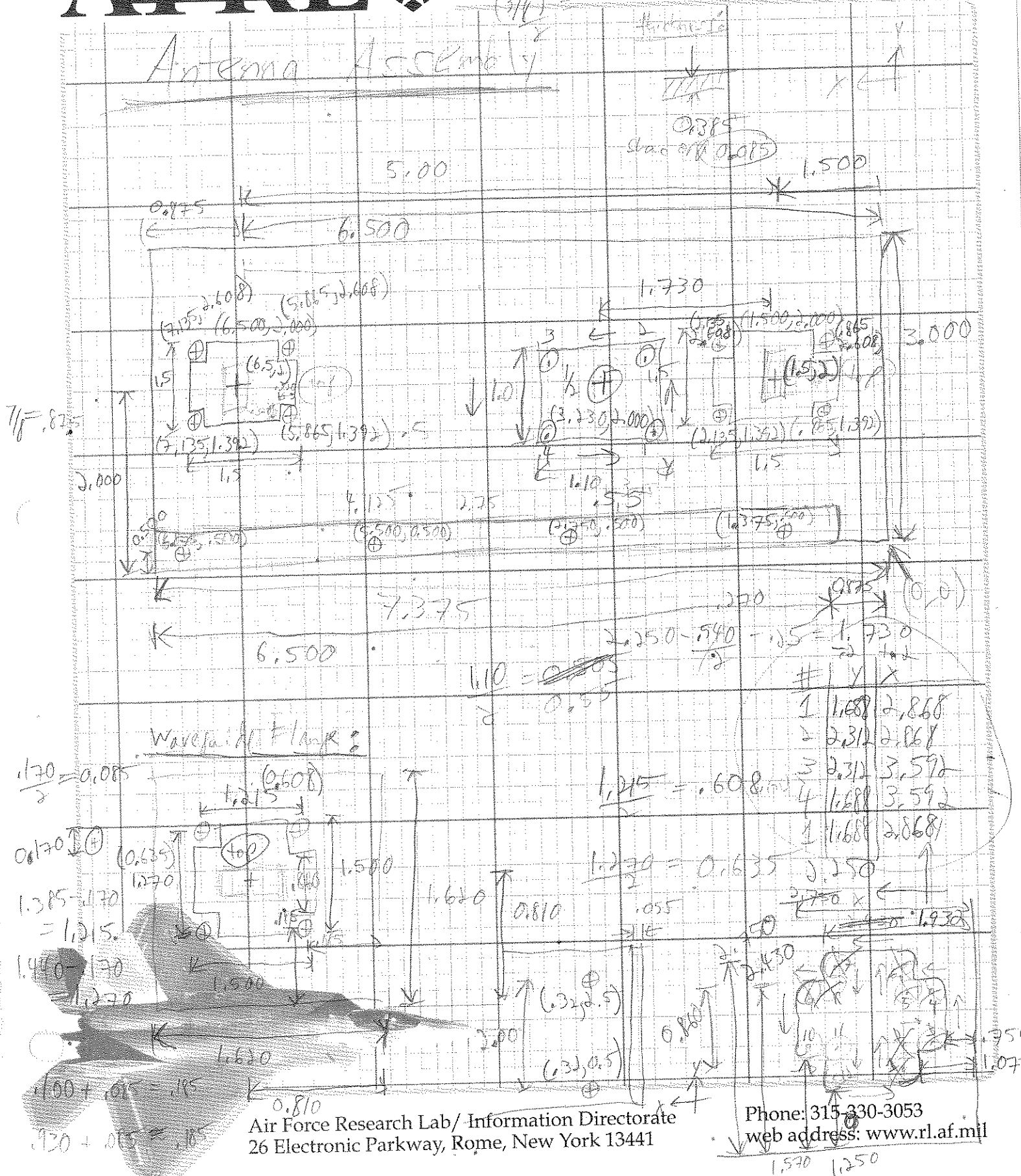


Air Force Research Laboratory
Information Directorate



(3/4)

Antenna Assembly



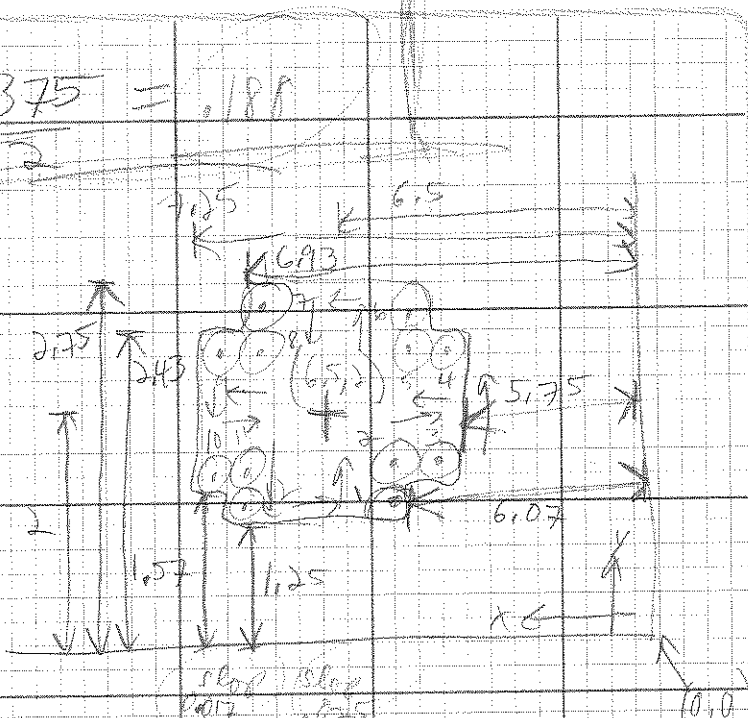


Air Force Research Laboratory
Information Directorate

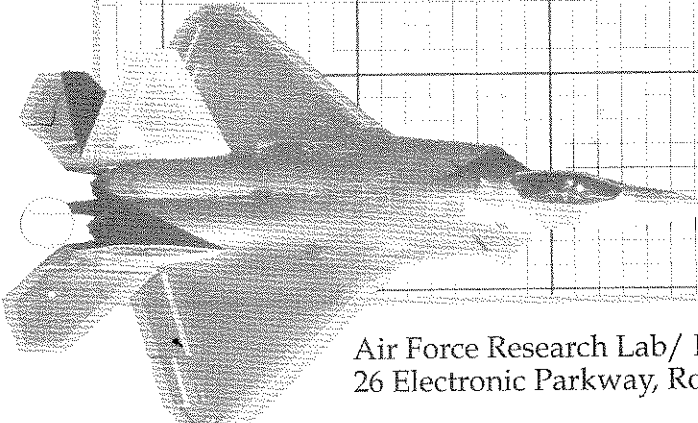
017
1025

$\frac{3}{8} = .375 = .188$

#	Y	X
✓1	1.438	1.258
✓2	1.758	1.258
✓3	1.758	.938
✓4	2.242	.938
✓5	2.242	1.258
✓6	2.562	1.258
✓7	2.562	2.242
8	2.242	2.242
9	2.242	2.562
10	1.758	2.562
11	1.758	2.242
12	1.438	2.242
1	1.438	1.258
8	2.242	1.93
9	2.242	2.062
10	1.758	2.062
11	1.758	1.742
12	1.438	1.742
1	1.438	1.258

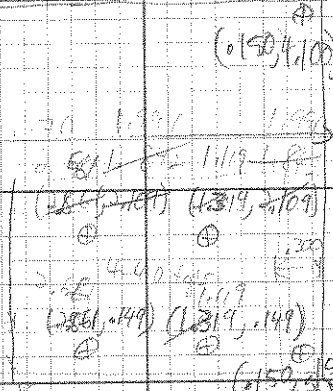
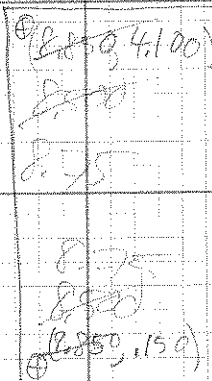


#	Y	X
✓1	1.438	6.258
✓2	1.758	6.258
✓3	1.758	5.938
✓4	2.242	5.938
✓5	2.242	6.258
✓6	2.562	6.258
✓7	2.562	6.742
✓8	2.242	6.742
✓9	2.242	7.062
✓10	1.758	7.062
✓11	1.758	6.742
✓12	1.438	6.742
1	1.438	6.258

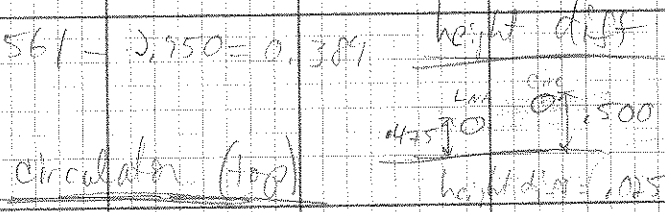
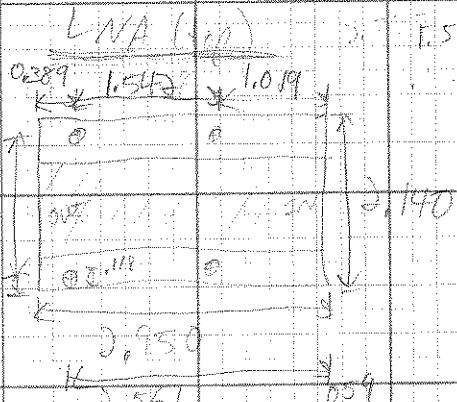


Receiver Module

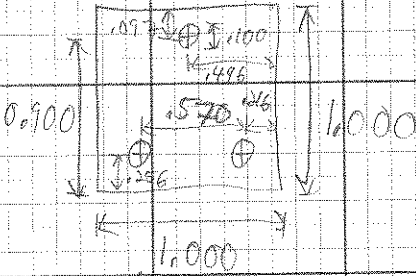
- Drill out LNA + Mount hole
- Mount LNA
- re-200 machine on circulator, now Dr. II part II



$$1.960 - 1.49 = 2.109$$



circulator (top)
X note, not a 11 out
small error in dist. prod



$$0.90 + 0.118 = 1.149$$

$$0.90 + 0.059 = 1.019$$

$$1.660 - 0.118 = 1.542$$

$$1.960 - 0.118 = 1.842$$

$$1.206 + 0.50 = 0.256$$

$$1.670 - 1.1 = 0.570$$

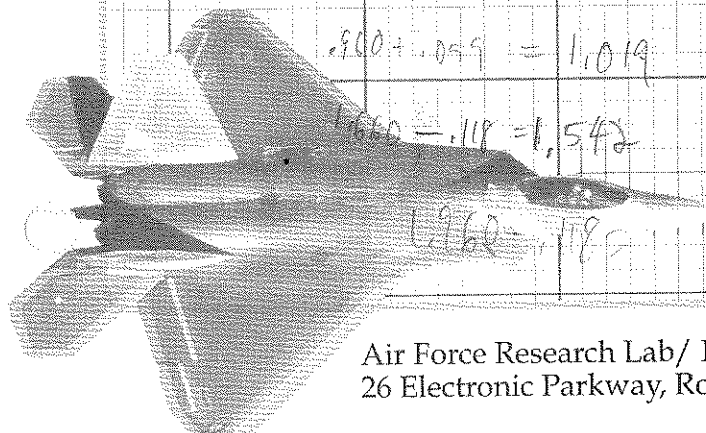
$$1.166 + 0.050 = 1.216$$

$$1.446 - 1.15 = 0.496$$

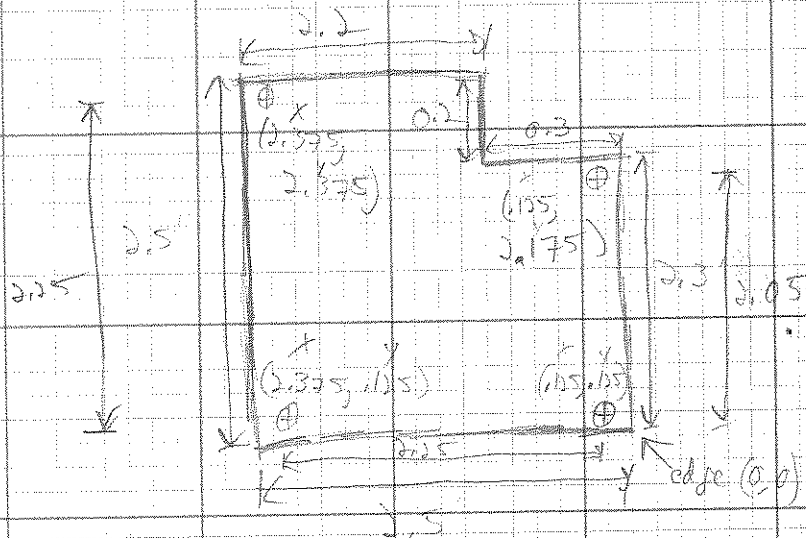
$$1.570 + 0.118 = 1.788$$

$$1.850 + 0.050 = 0.900$$

$$1.040 + 0.05 = 1.090$$

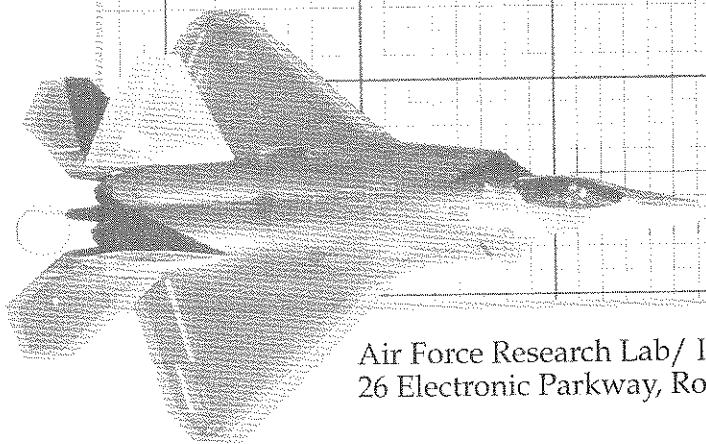


Metal Plate on Front Cover

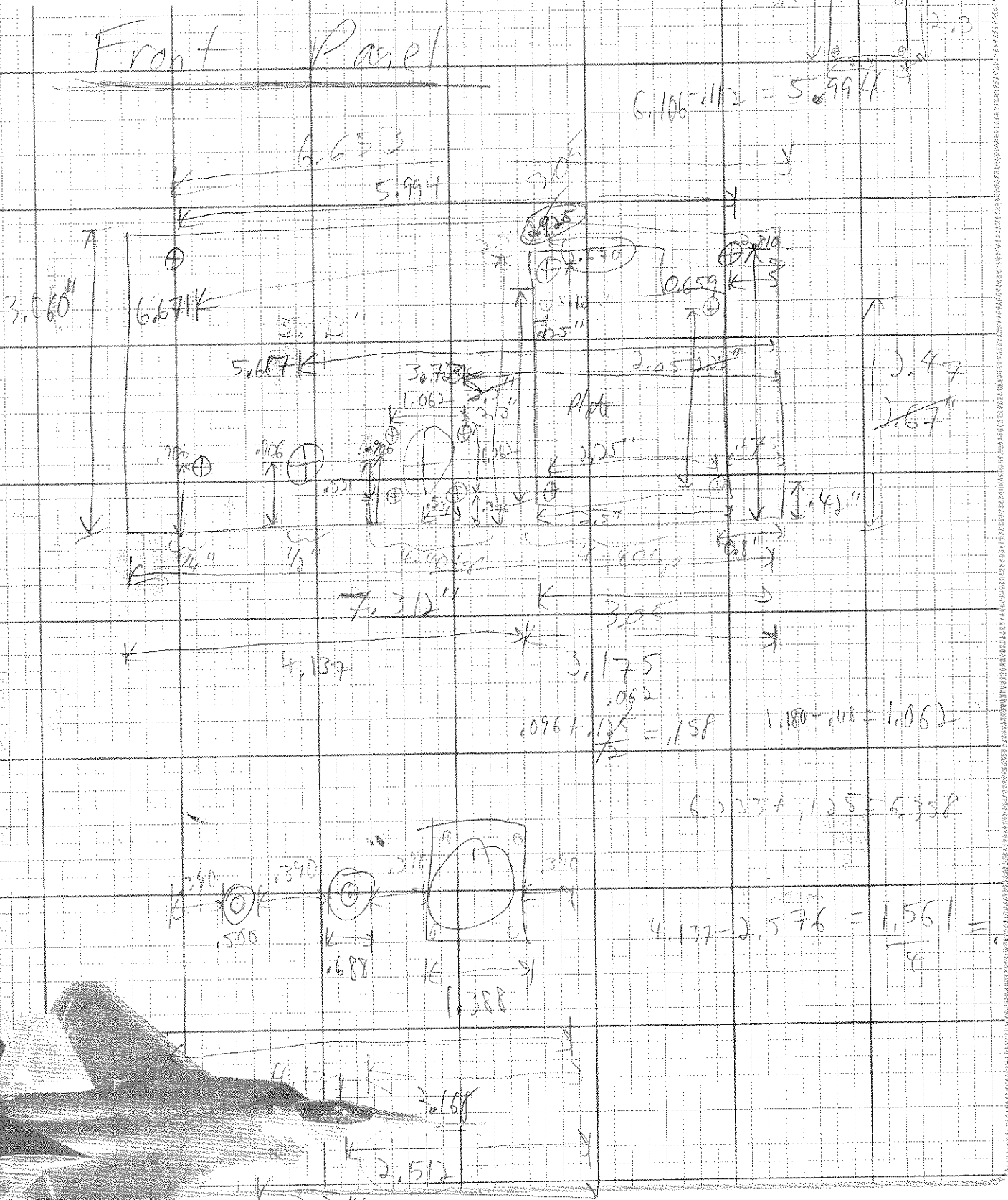


① cut plate

② drill pilots at specified coordinates

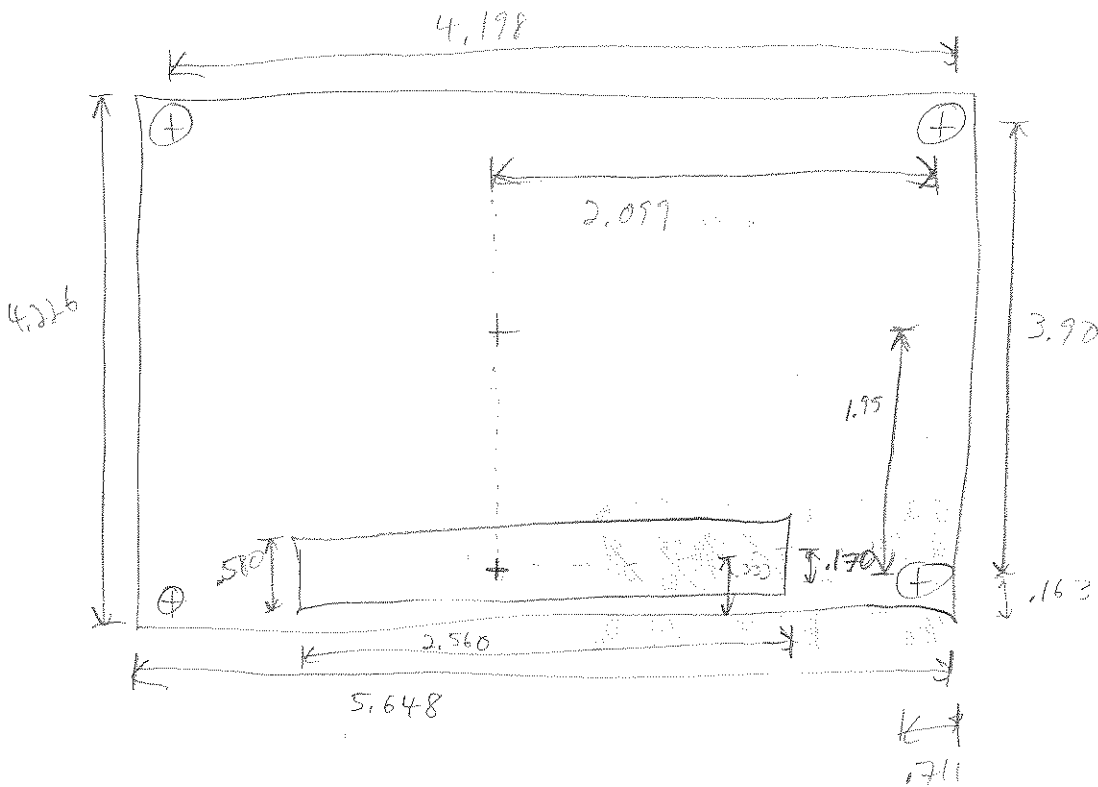


Front Panel



3.496

NI CB-68LP Board



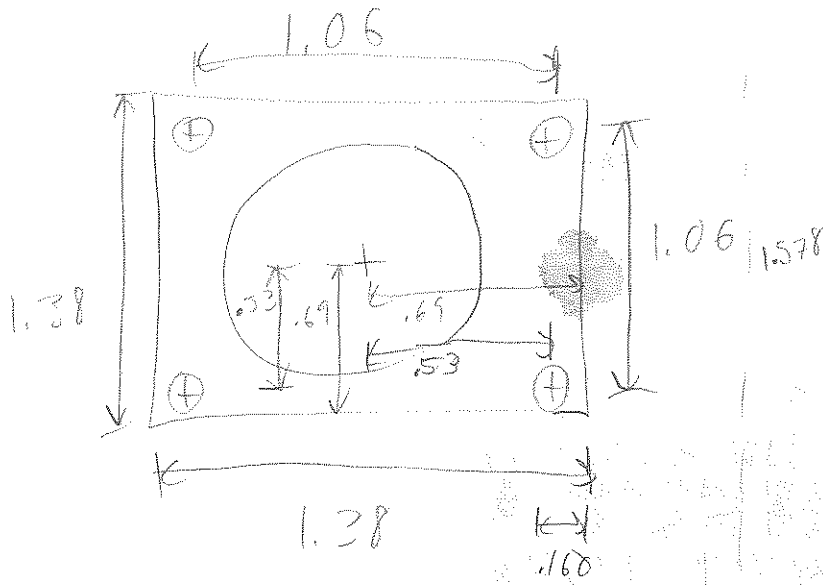
$$4.024 - .124 = 3.90$$

$$4.322 - .124 = 4.198$$

$$.028 + \frac{.110}{2} = .333$$

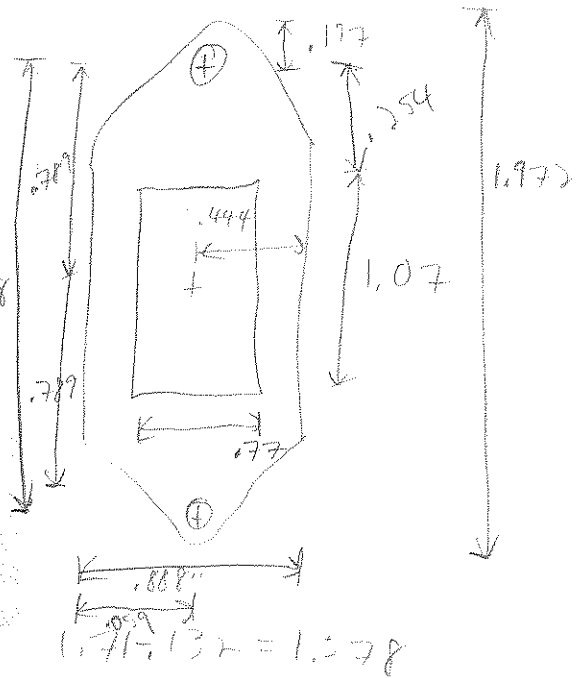
$$.333 - .163 =$$

Smaller Mil Connector:



$1.18 - .120 = 1.06$

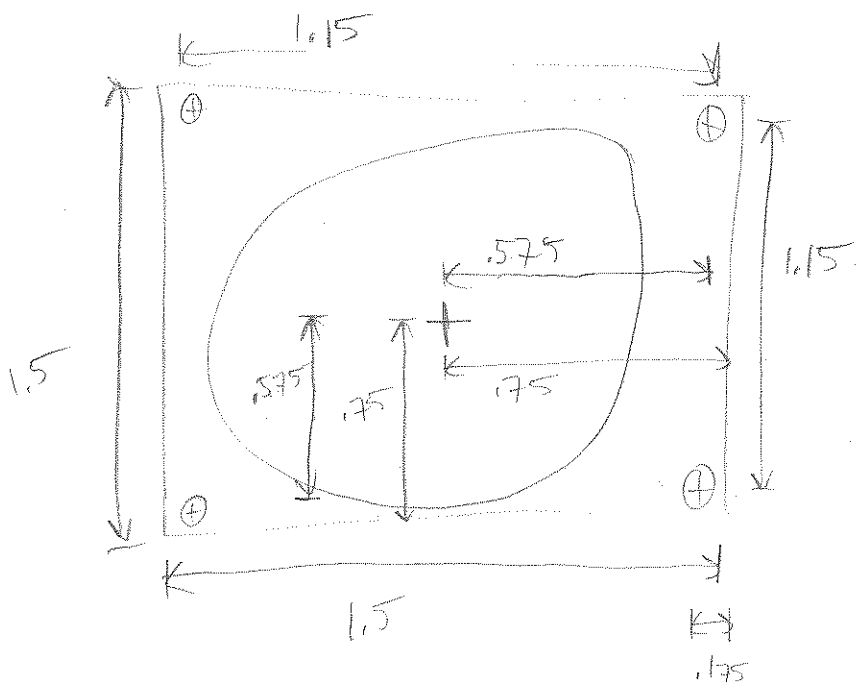
Top Connector:



Fuse Holder:

Larger Mil Connector:

$1.27 - .120 = 1.15$



O.D. = .688
flat footprint

1 BNC Female:



O.D. = .562
flat footprint